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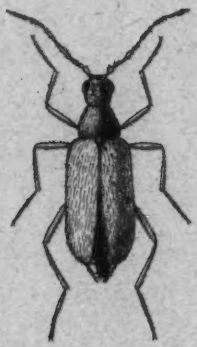

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OF MARCH 1900

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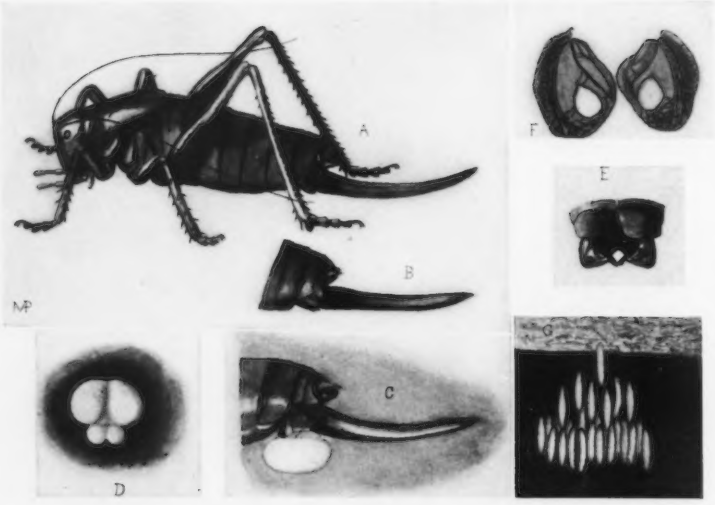

ANABRUS SIMPLEX HALD.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV. DECEMBER, 1904. NO. 10.

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Copulation and Ovulation in Anabrus Simplex Hald.

By C. P. GILLETTE.

The so-called Mormon cricket, *Anabrus simplex*, appeared in great numbers in portions of Routt County, Colorado, the past summer. While studying the habits of this wingless grasshopper, near Eddy, my attention was attracted by the large white masses of a jelly-like material that were attached to the abdomens of the females just beneath the ovipositors. They had also been noticed by the ranchmen who spoke of them as "white sacs" and "blubber." I concluded the phenomenon must be associated in some way with the process of fertilization and began an investigation. By pinching the abdomens of several females having the white masses attached I found they could be removed without breaking or tearing any organ and that they were held in place by the vulva which grasped a small portion or lobe. Several examples of both sexes were then taken at random from the swarm and their abdomens were opened in search of this body but it was not found. I noticed, however, that the seminiferous tubules of the males were filled with a milky white fluid before copula-

tion, and that after copulation they were empty and yellow in color. A male and female *in copula* were then separated, just before the close of the process and before the sperm mass had made its appearance. The male abdomen was then pinched so as to crowd the contents towards the end, and a sperm mass, exactly like those taken from females, was obtained. I therefore concluded that during copulation the males fill these sacs with seminal fluid and then transfer them bodily to the females who seize them by two of the small lobes, Fig. 1 C and D. The females carry these conspicuous white objects about for a time, extracting a portion, at least, of their contents for the fertilization of the ova.

It was noticed that the females bearing these seminal sacs were most numerous about 9 or 10 o'clock in the morning, and that few or none could be found after 1 or 2 in the afternoon.

Mr. W. W. Miles, postmaster at Eddy, told me he and Mrs. Miles noticed these white sacs attached to the females in great numbers on their ranch during the forenoon of June 27th. Mr. Miles also noticed the females depositing eggs July 5th.

While passing through a large swarm of the hoppers at 9 o'clock in the morning of July 29th, it was noticed that fully half of the females were carrying about these sacs, and the males everywhere were noisy with their stridulations. Whether copulation takes place more than once during the egg-laying period of a female, I have been unable to determine with certainty.

Numerous females bearing the sperm sacs were dissected and in all cases there were many eggs present in the ovaries, some with dark firm shells, apparently ready to be deposited, and others soft and yellow and in all stages of maturity from those less than half-grown to those of full size.

There was no indication that the eggs were developing in sets or broods, for they seemed to grade through all stages from those that were small and just developing to those fully mature. Counts made at Eddy on July 27th gave from 10 to 35 apparently mature eggs, and from 34 to 46 immature eggs in ovaries of single females taken with the sperm sacs attached.

As females taken from this swarm a few days previous had, in several cases, over 100 eggs, in one case 133, and as Mr. W. W. Miles saw so many of the sperm sacs attached to the females of the same swarm on June 27th, and as I again saw them so abundant in a neighboring swarm on July 29th, it seems probable that copulation takes place more than once, particularly as the individuals in a swarm develop very closely together. As nearly as could be ascertained, the swarm at Eddy had all been adults since June 25th, and probably for several days prior to that time.

The manner of ovipositing is to bring the tip of the ovipositor well forward beneath the abdomen and insert it in a nearly perpendicular position. Hill sides and hill tops, where the vegetation is scanty and where the bushes are small, seemed to be the favorite places for egg-laying. A clay or adobe soil with many small cracks in the thin surface crust where the ovipositor could be easily inserted was especially used for egg-laying.

The sperm sac measures from 10 to 12 millimeters in diameter when first obtained from the male, and it all appears to view during the last few seconds of the copulatory act. As soon as it appears to view the female begins to run about, dragging the male upon his back behind her until, catching upon some object, he is pulled loose.

The sac, when first received, is suggestive of the brain of a higher vertebrate in form, there being two large lobes corresponding to the cerebral hemispheres and beneath these four smaller lobes corresponding to the quadrigemina somewhat enlarged. The upper pair of these little lobes are somewhat smaller than the others and are pale yellowish in color resembling cartilage. The larger pair are milk-white in color at first, even whiter than the hemispheres, and it is these that are clasped by the vulva of the female. At D of the accompanying plate the two large hemispheres and the two milk-white lobes are all that show, the other pair of lobes being hidden behind the small pair shown.

After being held in the vulva of the female for a short time the small milk-white lobes become gradually translucent and

yellowish in color like the other small pair. For a time there is an opaque white globule at the center of each lobe which gradually diminishes in size, until they are entirely cartilaginous in appearance.

These small lobes are all quite firm to the touch while the two very large ones are soft and easily crushed and torn as the female crawls about.

After two or three hours these masses disappear entirely, but whether the contents are largely taken in by the female or whether she rejects the greater portion after extracting the spermatozoa, I did not determine.

Copulation* began soon after sunrise and continued until near noon in the swarms I visited. I did not witness the beginning of the copulatory process, but in no case did a pair remain in *coitu* more than ten minutes after I noticed them. After about 10 in the morning the chirping of the males almost entirely ceased, except as they were disturbed by some moving object, and then the squeaking noise which they make seemed to be entirely a note of warning, and would cause the members of the swarm to run or jump in all directions for a distance of 20 or 30 feet, and sometimes farther, as if frightened.

The position of the male during copulation was, either curled beneath the female—literally standing on his head—or lying upon his back beneath her and being dragged behind her if she chose to walk about.

EXPLANATION OF PLATE XIX.

Anabrus simplex Hald.—A, adult female; B, a comparatively straight ovipositor; C, sperm mass clasped by vulva of female; D, the sperm mass removed immediately after copulation showing the two small lobes which are seized by the vulva of the female; E, end of male abdomen from above showing clasping organs; F, wings of adult male; G, a cluster of eggs, the upper one coming to the surface. All natural size except E and F, which are twice natural size.

---

* I am under obligations to Mr. C. L. Marlatt, Acting Chief of the Bureau of Entomology, for having a search made in the library of the Bureau for published observations upon copulation in this genus of Orthoptera. The librarian, Mr. Nathan Banks, found nothing upon the subject. The writer knows of no such observations except those here recorded.

Notes and Records of New Jersey Orthoptera.

By James A. G. Rehn.

The following records have been made almost entirely from material studied during the past year. Although New Jersey, entomologically considered, has been examined more closely than any other Middle Atlantic state, the localities given in this paper may assist in mapping with greater accuracy the distribution of the insects of this order within the State, when taken in conjunction with the great number of published records. The enormous influence of environment is no better illustrated than by the distribution of certain species of Orthoptera found in the cedar swamps, while the apparent preference of other species for the absolutely dry pine barrens is quite as remarkable.

The author has spent considerable time in the wilder and more unfrequented sections of south and central New Jersey, a portion of which at least is very thinly settled—a land which formerly was the centre of a thriving iron industry but now almost deserted. In some of the more inaccessible portions of Ocean and Burlington Counties the cedar swamps and pine lands are absolutely primæval for miles, a condition, the average individual would not expect to find in a state so long settled as New Jersey. As many specimens have been collected miles away from any town or named, stream I have been compelled to designate them as taken between *such* and *such* points.

The principal localities mentioned in the following pages are here listed to prevent needless repetition of county names:

Boonton, Morris Co., Riverton, Burlington Co., Medford, Burlington Co., Taunton, Burlington Co., Atsion, Burlington Co., Bear Swamp, Burlington Co., between Cedar Grove and Chatsworth, Burlington Co., Whitings, Ocean Co., near West Creek, Ocean Co., Stafford's Forge, Ocean Co., Clementon, Camden Co., Atco, Camden Co., Da Costa, Atlantic Co., Westville, Gloucester Co., North Woodbury, Gloucester Co., Cape May, Cape May Co., Anglesea, Cape May Co.

BLATTIDÆ.

Ischnoptera uhleriana Saussure (= **unicolor** Scudder).

Peermont, Cape May Co., July 13, 1901 (Rehn). [♂]. Atsion, Oct. 8, 1903 (Hebard). [♀.]

ACRIDIDÆ.

Nomotettix cristatus (Scudder).

Atsion, Oct. 8, 1903 (Hebard).

Acrydium obscurum (Hancock).

"N. J." (Academy coll.).

The separation of *obscurum*, *arenosum* and *gibbosum* is a task which is practically hopeless. The extremely slight differentiation of these "species" is by no means sufficient to entitle them to full specific rank. There is, of course, some evidence in favor of regarding *obscurum* as a geographic race of *arenosum*, but there appears to be no question but that *gibbosum* is inseparable from *obscurum*. Blatchley (Orth. of Indiana, p. 225) has presented his views on the case, and my experience with all available material has been the same.

Paratettix cucullatus (Burmeister).

Boonton, January 10, 1901 (G. M. Greene).

Tettigidea parvipennis (Harris).

Atsion, Oct. 8, 1903 (Hebard). Ortley, Ocean Co., May 16, 1903 (Viereck). Ocean City, Cape May Co., April 19, 1903 (Viereck).

Tettigidea lateralis (Say).

Cape May, June 4, 1903 (Viereck).

It is rather interesting that the extreme southern point of New Jersey should be the home of true *lateralis*, while its northern congener *parvipennis* should reach as far south as Ocean City. It is quite likely that the two forms overlap or intergrade along the coast of southern New Jersey, but at all events the Cape May specimens are typical *lateralis*.

Tettigidea armata Morse form **depressa** Morse.

"N. J." (Academy coll.)

Truxalis brevicornis (Johannson).

Near West Creek, Sept. 6, 1903 (Rehn). Not common, taken in tidal marsh.

Syrbula admirabilis (Uhler).

Stafford's Forge, Sept. 6, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard). Cape May, Sept. 21, 1903 (Daecke).

At Stafford's Forge and in the vicinity of West Creek this species was fairly common on several stretches of white sand covered with the remains of cut scrub oak. At Atsion Mr. Hebard found the species well represented, six specimens being taken, of which four were males.

Orphulella pelidna (Burmeister).

Stafford's Forge, Sept. 6, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard). Cape May, Aug. 7, 1903 (Viereck).

Dichromorpha viridis (Scudder).

Boonton, Aug. 22, 1901 (G. M. Greene). Bear Swamp, Aug. 13, 1902 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

Clinocephalus elegans Morse.

Near West Creek, Sept. 6, 1903 (Rehn). Cape May, July 28, 1903 (Viereck) [immature].

Chorthippus curtipennis (Harris).

Angelsea, Cape May Co., Sept. 4.

Arphia sulphurea (Fabricius).

Westville, May 1 (Rehn). Da Costa, July 5, 1903 (Daecke). West Plains, Burling. Co., June 21, 1901 (Rehn).

Arphiax anthoptera (Burm).

Near West Creek, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard). Atco, Oct. 14. Medford, Sept. 7, 1902 (Stone). Riverton, Aug. 3, 1899 (Rehn).

Chortophaga viridifasciata (De Geer).

Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard) [adult and nymph]. Bear Swamp, Nov. 1, 1903 (Rehn) [nymph].

Spharagemon bolli (Scudder).

Between Cedar Grove and Chatworth, Sept. 7, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard), Sept. 2, 1901 (Rehn). Almonesson, Gloucester Co., Sept. 18.

Spharagemon collare wyomingianum (Thomas).

Atsion, Oct. 8, 1903 (Hebard), Sept. 2, 1901 (Rehn), Da Costa, July 19 (Skinner).

Scirtetica marmorata (Harris).

Stafford's Forge, Sept. 6, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn), Atsion, Oct. 8, 1903 (Hebard). Lucaston, August 10, 1903 (Daecke).

This is one of the most characteristic species of Acrididæ found in the dry portions of the "barrens."

Psinidia fenestralis (Serville).

Riverton, Sept. 2, 1900 (G. M. Greene), Sept. 8, 1901 (Viereck). Westville, Aug. 19, 1897 (Rehn).

Schistocerca alutacea (Harris).

Near West Church, Sept. 6, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Stafford's Forge, Sept. 6, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

Melanoplus scudderi (Uhler).

Atsion, Oct. 8, 1903 (Hebard). Apparently common, as Mr. Hebard secured ten specimens in a comparative short time.

Melanoplus fasciatus (Walker).

Whitings, Sept. 5, 1903 (Rehn). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn).

Melanoplus atlanis (Riley)

Bear Swamp, Nov. 1, 1903 (Rehn). Riverton, Aug. 11, 1901 (Viereck). Atco, Oct. 14. North Woodbury, Gloucester Co., Aug. 11, 1901 (Viereck). Big Timber Creek, Camden–Gloucester Co's, Sept. 22, 1901 (Viereck). Atsion, Oct. 8, 1903 (Hebard).

Melanoplus impudicus Scudder.

Between Harris and White Horse, Aug. 13, 1902 (Rehn). Atsion, Sept. 2, 1901 (Rehn) and Oct. 8, 1903 (Hebard).

This species has never before been recorded on the Atlantic north of Georgia, from which State and Mississippi Scudder described it. Prof. A. P. Morse has very kindly examined several New Jersey specimens and pronounced them *impudicus*. The Academy collection contains a male specimen taken at Chickamauga, Walker Co., Georgia, June 24, 1898 (Viereck).

Melanoplus femur-rubrum (De Geer).

Near West Creek, Sept. 6, 1903 (Rehn). Stafford's Forge, Sept. 6, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

This common and widely distributed species appears to be absent from the true barrens, but any small cultivated clearing though surrounded entirely by heavy timber, will contains its colony of *femur-rubrum*.

Melanoplus luridus (Dodge).

Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Whitings, Sept. 5, 1903 (Rehn).

After examining the material in hand I heartily endorse Blatchley's recent work in synonymizing *M. collinus* with this species (Orth. of Ind., p. 325), on evidence supplied by Morse after examining the material in the Scudder collection.

Melanoplus femoratus (Burmeister).

Atsion, Oct., 8, 1903 (Hebard). Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Near West Creek, Sept. 6, 1903 (Rehn).

Paroxya scudderi Blatchley.

Atsion, Oct. 8, 1903 (Hebard). Speedwell, Aug. 12, 1902 (Rehn). Bear Swamp, Aug. 13, 1903 (Rehn).

A series of nine specimens from New Jersey appear to be identical with authentic specimens (♂ and ♀) kindly furnished by Prof. Blatchley. This form is in New Jersey a cold bog species, and at Bear Swamp was taken together with *P. floridiana*, which is explained by the location of the Swamp at the extreme western edge of the cedar swamp and bog region,

and also by the fact that it is somewhat tinged with the fauna of the Delaware Valley, a region in which *floridiana* is moderately common. The coast region seems to be frequented by *floridiana* alone, several specimens of which were taken near West Creek, Sept. 6, 1903 (Rehn). The record of *floridiana* from Speedwell (ENT. NEWS, xiii, p. 316) is erroneous, as only *scudderi* was taken there. The color of *scudderi* as exhibited by the New Jersey specimens is very dark and with but little color contrast.

These records carry the range of the species east of the Alleghanies, west of which it was known only from Indiana.

TETTIGONIDÆ.

Scudderia furcata Brunner.

Near West Creek, Sept. 6, 1903 (Rehn). Riverton, Sept. 8, 1901 (Viereck).

Scudderia texensis Saussure and Pictet.

Atsion, Oct. 8, 1903 (Hebard). Between Cedar Grove and Chatsworth, Sept. 7, 1904 (Rehn).

Scudderia curvicauda (De Geer).

Riverton, Aug. 11, 1901 (Viereck).

Amblycorypha uhleri Stal.

Atsion, Oct. 8, 1903 (Hebard).

Conocephalus atlanticus Bruner.

Atsion, Oct. 8, 1903 (Hebard). These specimens (2) have been compared with paratypes.

Orchelimum vulgare Harris.

Near West Creek, Sept. 6, 1903 (Rehn). Atsion, Oct. 8, 1903 (Hebard).

Xiphidion brevipenne Scudder.

Near West Creek, Sept. 6, 1903 (Rehn). Taunton, Sept. 6, 1902 (Stone). Medford, Sept. 7, 1902 (Stone). Atsion, Oct. 8, 1903 (Hebard). Cape May, Aug. 1, 7 and 23, 1903 (Viereck). Riverton, Sept. 8, 1901 (Viereck). Atlantic City, Sept. 11, 1902 (Rehn).

The Atlantic City specimens have been recorded as *X. nemo-*

rale (ENT. NEWS, xiii, p. 315) and the Riverton individuals as *X. saltans*.

Xiphidion fasciatum (De Geer).

Atsion, Oct. 8, 1903 (Hebard). Taunton, Sept. 6, 1902 (Stone). Medford, Sept. 5, 1902 (Stone). Near West Creek, Sept. 6, 1903 (Rehn).

Xiphidion saltans Scudder.

Atsion, Oct. 8, 1903 (Hebard).

These specimens agree very well with the descriptions of *saltans*, except for the fact that the body measurements of the female are slightly larger, while the ovipositor is about one and a half mm. shorter. The structure of the male cerci and the coloration fully agree with the figures and descriptions.

Xiphidion strictum Scudder.

Atsion, Oct 8, 1903 (Hebard). Both forms of the species and both sexes of each other are represented in the series from this locality. The cerci of the male of the long-winged type are somewhat different from those found in the short-winged male, which is typical when compared with determined Nebraska material.

GRYLLIDÆ.

Tridactylus terminalis Scudder.

Lavallette, Ocean Co., May 20, 1903 (Viereck).

Nemobius fasciatus (De Geer).

Medford, Sept. 7, 1902 (Stone). Atsion, Oct. 8, 1903 (Hebard).

Nemobius carolinus Scudder.

Atsion, Oct. 8, 1903 (Hebard). Near West Creek, Sept. 6, 1903 (Rehn).

Gryllus luctuosus Serville.

Atsion, Oct. 8, 1903 (Hebard). Riverton, Sept. 10, 1899.

One female in the Atsion series (9) might be mistaken for *G. firmus*, as it is of extremely large size, but all the structural characters are those of *luctuosus*, except the number of tibial spurs which appears to be of little or no taxonomic value.

Gryllus pennsylvanicus Burmeister.

Near West Creek, Sept. 6, 1903 (Rehn). Between Chairville and head of Batsto River, Burlington Co., June 17, 1901 (Rehn).

Œcanthus angustipennis Fitch.

Between Cedar Grove and Chatsworth, Sept. 7, 1903 (Rehn). Clementon, Aug. 13, 1899 (Viereck).

Œcanthus quadripunctatus Beutenmüller.

Westville, Aug. 31, 1899 (Viereck).

Description of Two New Species of Culex.

By JOHN A. GROSSBECK, Paterson, N. J.

Culex pretans sp. nov.

♀.—Head brown, occiput almost covered with pale yellow scales, some of which collect in a distinct border to the eyes, and with a small patch of dark brown scales on each side; antennæ dark brown, the basal two joints pale testaceous; proboscis and palpi dark brown, the terminal joint of the latter almost obsolete. Mesonotum brown with numerous yellowish scales and a usually well defined, broad median vitta of brown scales, which does not quite reach the anterior margin and is slightly constricted centrally; there are two other patches of scales of the same color, about one-third the length of the thorax, at the base of this vitta, separated from it by a narrow line of yellow scales; scutellum brown, with many yellowish bristles; metanotum evenly dark brown; pleura dark brown, with patches of pure white scales; halteres yellowish white, brown at the apex. Abdomen brownish black, the segments with narrow whitish basal bands, which become wide at the sides; beneath it is clothed with dirty white scales, mixed with some brown ones near the apical margin of the segments. The bands are usually clearly defined, and though narrow, are rarely obsolete. Legs with coxæ yellowish; femora brown above, creamy white beneath, and with a dot of the same color at the knee; tibiæ dark brown above, yellowish beneath; tarsi wholly brownish black; claws uniserrated on all feet; wings hyaline, petiole of first submarginal cell about half as long as this cell. Length 5 mm.

Described from fifteen females, one of which, with a male, was bred from larvæ.

Habitat: Chester, Trenton, Lake Hopatcong and Great Piece Meadows—all in New Jersey.

Types: in the collection of the New Jersey Experiment Station.

The only male was dissected; in color it does not differ from the female, but the thoracic stripe is slightly diffused and the abdominal banding is broader and less defined. The palpi are uniformly brown; the claws of the anterior and mid feet unequal, the larger biserrated, the smaller uniserrated, while the posterior ones are equal and uniserrated. Petiole of first submarginal cell not quite the length of this cell. Length 5.3 mm.

Culex inconspicuus sp. nov.

♀.—Head dark brown, occiput with pale yellow scales scattered over the surface; antennæ dark brown, the two basal joints pale testaceous; proboscis and palpi dark brown. Mesonotum dark brown with yellowish scales at the sides, forming a rather diffuse central brown vitta; shoulders brown, separated from the vitta by a narrow line of yellow scales; scutellum brown with yellow bristles; metanotum blackish brown; pleura brown, with small patches of grayish white scales; halteres pale brown, darker at the apex. Abdomen deep brown, with narrow dirty white bands at base of segments, which widen out laterally; beneath it is pale brownish with scattered white scales, more so apically. Legs with coxæ pale brown, femora brown, under side yellowish white, knee dot barely discernible; tibia and tarsi wholly brown; claws uniserrated on all feet; wings hyaline, petiole of first submarginal cell about one-third as long as this cell. Length 4 mm.

♂.—Palpi uniformly dark brown. Bands of abdomen narrow in the anterior segments, very wide in the posterior ones and with some mixed brown scales, giving the bands a dark appearance; beneath it is whitish, with brown scales intermixed. Claws of anterior and mid feet unequal, the larger biserrated, the smaller uniserrated; claws of posterior feet equal and uniserrated. Petiole of first submarginal cell about half as long as this cell. Length 4.5 mm. Otherwise as in the female.

Described from three ♂ and one ♀ bred from larvæ gathered on Garret Mts., Paterson, N. J.

Type: in the collection of the New Jersey Experiment Station.

A New Cryptine from the Nest of Ceratina Dupla.

By H. L. VIERECK.

Habrocryptus graenicheri, n. sp.

Superficially, this species resembles somewhat *C. atricollaris*, but differs in having the thorax and abdomen partly black and in the more distinct sculpture.

♀ 10 mm.; ovipositor 3 mm.

Head rather shining and covered with rather shallow, adjoining small

punctures, the occipital ridge very sharp; clypeus polished; scape rather pear-shaped, short and chunky; pedicellum wider than long; first joint of the flagellum nearly twice as long as the scape; antennæ twenty-seven jointed; greater portion of the thorax sculptured and shining nearly like the head; propleura rather transversely striated; the segment of the mesopleura immediately beneath the wings smooth and polished on the lower half, punctured on the upper half; scutellum polished, sparsely punctured; metanotum rugulose punctate, the posterior face rather rugose, basal area quadrate or nearly, polished, bounded by indistinct raised lines, two transverse, angulated, broken, raised lines extending across the metanotum from pleuron to pleuron and dividing the segment nearly into thirds, sinuate laterally, with a small curve extending anteriorly and a large curve posteriorly, in the middle of the segment straight and nearly parallel, forming the anterior and posterior boundary of the incomplete areola; wings clear, nervures and stigma very dark brown, areolet pentagonal, the sides converging above, the second abscissa of the radius nearly as long as the side of the areolet or the transverse cubiti.

Abdomen dullish, with small adjoining punctures, the apical segments more shining, the basal segment polished, smooth and not sculptured, with three lateral, longitudinal carinæ, the middle carina most prominent and almost bisected by the spiracle, the upper carina faint and obsolescent on the posterior half; the lower carina is a distinct, almost straight raised line.

Superficially appearing bare, but covered with short white, almost abundant pubescence that is erect, ferruginous, head black except an orbital undulate border that is broken between a point near the middle of the posterior edge of the eye and a point almost opposite the anterior ocellus, and extends down to near the insertion of the mandibles; a spot on each mandible, basal joint of maxillary palpi and joints eight, nine, ten and eleven above and laterally, all of which are yellowish, almost cream color; prothorax black except the anterior margin, which has a yellowish border, and the borders of the pleura, which are yellowish and brownish; anterior coxæ black internally, creamy white externally; proximate trochanter black with an apical yellowish border; distal trochanter blackish and brownish; mesonotum and sutures around scutellum and postscutellum black; scutellum yellowish, almost white; postscutellum ferruginous; tegulæ, tubercles and extreme upper edge of mesopleura anteriorly cream color or nearly; a border of blackish beneath the cream edge of the mesopleura; middle coxæ rather testaceous, brownish above, the trochanters brownish; tarsi and claws of four anterior legs and outer side of tibiæ brown, the inner side of these tibiæ yellowish; posterior legs ferruginous; distal trochanters, tibiæ, basal and apical joints of tarsi and claws brown; fourth abdominal segment blackish; fifth, sixth, seventh and eighth joints black, the seventh with a large

white spot covering nearly all of the dorsal surface of the segment; sheaths of the ovipositor black, ovipositor brown.

Type: Acad. Nat. Sciences, Philadelphia.

Type locality: Milwaukee, Wisconsin.

One specimen July 30, 1904. (S. Graenicher). Bred from nest of *Ceratina dupla*.

Anasa Tristis DeG.; History of Confined Adults; Another Egg Parasite.

By A. Arsene Girault.

On May 15th, 1904, a pair of these bugs, found in copula on a squash plant, were confined without separation, in a glass jar covered with cheese-cloth, and containing several inches of fresh earth; a fresh leaf of their food-plant was added from day to day.

They remained connected for some time, but were found separated on the morning of the 16th. However, sexual connections continued, off and on, until the morning of the 21st, when they were last observed. On the morning of the 23rd, the ♀ was found dead, without depositing any eggs. The ♂ remains in good condition.

Upon dissection, the abdomen of the ♀ was found to be almost devoid of contents, and no eggs were present. This was, at first, inexplicable, but was later explained by the appearance, on the morning of June 7th, of a large Tachinid with an orange abdomen, found flying noisily about in the jar. That a ♀ thus infested should go naturally about her functions seems peculiar at first thought.

On the 9th of June, morning, another ♀, captured from a squash plant was introduced into the jar with the original ♂. The following morning they were sexually connected, showing the ♂ to be polygamous, and hence liable to be found in relatively smaller numbers. Again, on the 19th of June, they were in copula, while the ♀ had previously oviposited as follows: June 15–16, 23 eggs; June 16–17, 22 eggs; June 18–19, 13 eggs, all of which were fertile. At 2 P. M., the 20th of June, the female was found ovipositing on a stem of a

fresh leaf. She had already deposited 10 eggs, when she was accidentally disturbed. A few moments afterwards, the pair were found again connected. On the mornings of the 22d of June and 2nd of July records of sexual connections were made, and doubtless copulation had been taking place during the time intervals between these records.

On the 2nd of July both of the insects were in good health, and fed quite often on the fresh leaves when they were supplied each morning, the punctures making a dark-green, "moist" spot, characteristic of the injury of haustellate insects to tender vegetation.

On July the 13th the ♂, having gradually grown weaker and weaker, died. It had lived 58 and one-half days in confinement. Six days later or on the 19th, the ♀ died. She lived 40 days, and deposited in that time 154 eggs. Depositions, other than those given in the foregoing, were as follows: June 21-22, 13 eggs; June 24-25, 13 eggs; June 28-29, 10 eggs; July 1-2, 22 eggs; July 3-4, 12 eggs; July 5-6, 7 eggs; July 7-8, 8 eggs; July 9-10, 1 egg, final deposit; previous deposits, 68 eggs; eggs in ovaries, 0 eggs.

This shows very plainly that the period of oviposition is quite lengthy, and that the largest masses found do not even indicate the normal number of eggs deposited by this species, as is intimated in the various writings on this insect. As our knowledge grows, we are finding continually that the ratings of the number of eggs deposited by some of our commonest and most injurious insects are entirely too small, and in many cases entirely too vague (being founded as they are on indefinite egg masses, on ovary contents, or even on estimates merely). For instance, I have shown * that the common bagworm (*T. ephemeræformis*) DEPOSITS EGGS TO AN AMOUNT double that previously estimated, and that the ratings of the number deposited by the American tent-caterpillar (*C. americana*) were far too low. † A more striking example, however, has recently come to my notice. One of our most common, wide-spread and injurious insects, one which has been the

* ENTOMOLOGICAL NEWS, 1901, page 305.

† ENTOMOLOGICAL NEWS, 1904, pages 2-3.

subject of investigations for the past forty years by several distinct boards of trained entomologists, and about which several volumes have already been written, was thought to deposit not more than 500 eggs. That estimate was taken as a maximum. About a year ago, one of the insects in confinement actually deposited, in round numbers, two thousand eggs ; and several months ago, another female in confinement, actually raised this by one-half, depositing three thousand eggs, or six times the first, and generally accepted estimate.

On the mornings of the 10th and 11th of June, *Hadronotus carinatifrons* Ashm., was observed ovipositing in the eggs of *Anasa*, and afterwards many of them were bred in confinement. They were at first taken to be *H. anasæ*, but a comparison of the descriptions indicated otherwise, and Dr. Ashmead later kindly determined them as *carinatifrons*.

Collecting Trip to Tulare County, California.

During the Month of May, 1904.

By CHARLES FUCHS.

My collecting trip in Tulare County started from Visalia to the Giant Forest to an elevation of about 7000 feet, and I can call the result successful in regard to having collected some rare and interesting beetles.

From Visalia I went to San Joaquin Mill, five miles, to collect a variety of *Cicindela pusilla* var. *lunalonga* Schaupp, of which species the type is in my possession. This species was very rare until Dr. Van Dyke discovered it in Tuolumne County. I have been successful in securing many specimens with the different varieties ranging to black without any markings whatever on the elytra. Of *Cicindela vulgaris* var. *vibex*, which species is found with *lunalonga* on alkali ground near water, I could find only four. Maybe I came too late. October and November, according to Mr. Ralph Hopping, will be the time to collect both species again and *vibex* (fide Hopping) will have a brighter green in the fall than in the spring.

On the way from San Joaquin Mill to Kaweah (1000 feet elevation) I beat willow with good results. In Kaweah,

Redstone Park, for eight days I had very good results. I shall mention here only a few species of importance. *Scaphinotis subtilis* Schaum. on very damp spots near water, rare; *Asida capitosa* Horn on very dry spots on the road or hills where I found them usually climbing up on the grass, not plentiful; *Phobetus comatus* Leconte, at sunset coming out of the ground, especially under oak trees, flying about fifteen minutes, all males. Females stay at the entrance of their homes. I secured larvæ by digging in the ground, plentiful. *Cænonycha rotundata* Horn, attracted by light, rare. I was very much disappointed in not being able to secure in the Lucanidæ that most interesting species of *Diphyllostoma fimbriata* Fall, new genus, new species, discovered by my friend, Mr. Hopping, in Redstone Park, May 8th, and described by Professor Fall in the Canadian Entomologist, Vol. 33, No. 11, 1901. I made use during eight days of all my experience to find it. At sunset this beetle is found sitting on the tip of a spear of grass. The surrounding trees are oaks which I have investigated carefully. Next year I shall have to try again.

On my way to the Giant Forest from the entrance in the Sequoia National Park, 3000 feet, I collected *Omus intermedius* Leng, to 4000 feet under stones, but only on the north exposure of the mountain road. Of *Calosoma latipennis* Horn, only one; *Melæ barbarus* Lec., two specimens. *Metrius contractus* var. *sericeus* Rivers, not rare. Three different species of the genus *Scaphinotus*, one of them probably a new species. The *Ceanothus* bushes in fresh bloom furnished interesting material. At 5000 feet elevation, the region for *Omus lævis* Horn, begins and continues to 7500 feet and to 11,000 feet, the smooth form of *O. lævis* may be collected everywhere, under stones, fallen trees and boards; deep snow prevented my going so far up. Mr. Hopping found on the *Ceanothus* flower a beautiful *Clerus eximius* Mann., 4200 feet, twice the size of specimens found at Berkeley. Colony Mill, 5415 feet, *Zopherus granicollis* Horn, only one. Different specimens of Cerambycids and fourteen different Scolytides on the fly at sunset. *Scaphinotus oreophilus* var. *riversii*, Roeschke, is to be found from here to an elevation of 7500 feet, not rare.

In the small material collected on the fly at sunset in Giant Forest and Sierra Camp I found many minute specimens new to my collection, of which I shall give a later report when worked up.

Formica sanguinea, subsp. rubicunda, Em. and Xenodusa cava Lec.;

or the discovery of pseudogynes in a district of Xenodusa cava Lec.

By PROF. H. MUCKERMANN, S.J.,

Sacred Heart College, Prairie du Chien, Wis.

It may be known to the reader that in 1895 E. Wasmann, S.J., advanced the hypothesis that the so-called pseudogynes ψευδής = false, λυνή = female, in the colonies of *Formica sanguinea* owe their existence and development to the rearing of the beetle *Lomechusa strumosa* F. The morphological characteristics of these pseudogynes will be easily understood from the accompanying figures. In the case of common workers (Figs. 3 and 2c) we find the pronotum strongly developed, whilst the mesonotum is but small. The normal female (Fig. 2a), on the contrary, has a small pronotum and a strongly developed mesonotum. The *pseudogyne* (Fig. 4 and 2b) combines with the size and abdomen of a worker the mesonotum of a female; it makes the impression of a deformed female as well as of a deformed worker. A *pseudogyne* is a frustrate creature, a ruined existence. Not being able to lay eggs or to perform the functions of workers, it is a useless burden of the colony and tends to finally degenerate the species.

After a careful research of five years, during which he examined and studied with the closest attention no less than 410 colonies of *Formica sanguinea*, Wasmann succeeded in raising the following four propositions to established theses:

1. The districts of pseudogynes always coincide with the districts of *Lomechusa strumosa*.

2. The colonies of *Formica sanguinea* containing pseudogynes are always the centres of the districts of *Lomechusa strumosa*.

3. Without the districts of *Lomechusa strumosa*, there are no pseudogynes to be found in the colonies of *F. sanguinea*.

4. No pseudogynes exist in colonies of *Formica sanguinea*, where *Lomechusa strumosa* is found in the imago stage, but they exist only in those colonies in which the larvæ of *Lomechusa strumosa* are reared for a number of years.

The above propositions Wasmann succeeded in verifying not only for *Formica sanguinea* and *Lomechusa strumosa*, but also for *Formica rufa* L. and *Atemeles pubicollis* Bris, or *Lomechusa strumosa*; for *Formica rufibarbis* F. and *Atemeles paradoxus*

Grav. ; for *Formica fusca* L. and *Atemeles emarginatus Payk.*, etc., etc.

Now this array of facts was gathered in Europe, but it led the famous biologist to surmise that probably a similar relation existed between the American *Xenodusa cava* Lec. and its hosts, namely : *Camponotus pennsylvanicus* Deg., *Camponotus ligniperdus* var. *pictus* For., *Formica sanguinea* subsp. *rubicunda* Em., *Formica pallidefulva*, subsp. *schaufussi* Mayr., * and *Formica exsectoides* For.

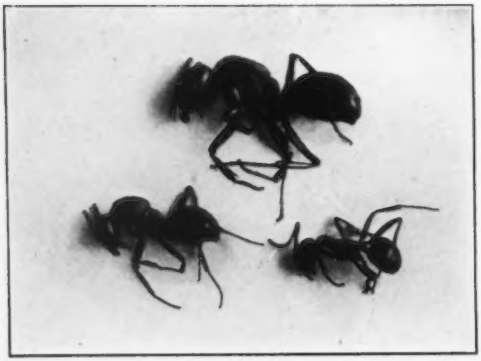
However, no pseudogynes had as yet been observed in any of the colonies of the ants just mentioned.

Wasmann, therefore, repeatedly called my attention to this, and in his letter of March 19, 1901, directed me to attend especially to the following points : (1) Which is the host that rears the larvæ of *Xenodusa cava?* and (2) Do the colonies of that host contain pseudogynes?

On August 23, 1900, I had been so fortunate as to find near Prairie du Chien, Wis., seven specimens of *Xenodusa cava* (Fig. 1) in a nest of *Camponotus pictus*. Subsequently I examined and searched not only the nest of *C. pictus*, but all the nests in the neighborhood with the hope of discovering, if possible, the larvæ of *Xenodusa cava* and the supposed pseudogynes. The task was tedious and discouraging. The soil which the ants had chosen for their subterranean habitation was rather stony ; besides, the time when the Xenodusæ were found was precisely the period in which some ant-guests change their hosts, so that it was altogether doubtful whether the specimens sought for would be contained in the nest of *Camponotus pictus*. In fact, it was not before the October of 1901, after many expeditions during the entire spring and summer seasons, that my efforts were crowned with success. In a colony of *F. rubicunda* within some 100 feet of the place where *Xenodusa cava* was originally observed, a number of true pseudogynes were discovered. They are shown in the accompanying photograph (Fig. 2). Great was my joy when beholding for the first time these helpless creatures with their small abdomen and strongly developed mesonotum. Their whole behaviour excellently corresponded to the descriptions I had read in the writings of Wasmann, and their strange thorax in particular closely resembled that of the pseudogynes of *Formica sanguinea* received from Holland. This is, to my knowledge, the first case observed in this country of pseudogynes found in the district of *Xenodusa cava*.

Now from analogy, it was a priori probable, that the same

*This fact I owe to Professor Wheeler, who wrote in his letter of September 8, 1902, that he had found *Xenodusa cava* in nests of *F. schaufussi* and *C. pictus* on several occasions.



FORMICA SANGUINEA, SUBSP. RUBICUNDA, EM. AND XENODUSA CAVA LEC.

MUCKERMANN.

causal relation, which Father Wasmann had established for *F. sanguinea* and *L. strumosa* should exist between *F. rubicunda* and *X cava*.

But in spite of continued investigations I was unable to substantiate this proposition any further, and in all probability there is no hope at present to secure new material in this region.

In the spring of 1902 the only nest of *F. rubicunda* which contained pseudogynes and was located in the district of *Xenodusa cava*, was found totally destroyed by heavy rains. In the numerous other nests of *F. rubicunda* there were no traces of either pseudogynes or larvæ of *Xenodusa cava*.

It is hoped, however, that this brief notice will suffice to induce such as are interested in the biology of ants to give their attention to the remarkable relation mentioned above, as well as to search for further facts which would confirm the one observed in this region.

I close this paper by calling the attention of the reader to the interesting question how this strange relation between the existence and development of pseudogynes and the rearing of the larvæ of *Xenodusa cava* ought to be explained. Wasmann is of the opinion that the repeated rearing of the beetle causes a gradual change in the brooding instincts of the ants, so that the pseudogynes are but a developmental stage of such larvæ, as were originally destined to become females, but in course of their later development were transformed into workers. Besides, an interesting psychic problem is suggested by the fact that it is the fault of the ants themselves that these encumbrances on their commonwealth come into existence and multiply with such rapidity.

Of the numerous publications of E. Wasmann, S.J., on this subject we mention especially the following:

1. Die ergatogynen Formen bei den Ameisen und ihre Erklaerung. Biologisches Centralbl. XV., 1895, pp. 606–646.

2. Kritisches Verzeichnis der myrmekophilen und termitophilen Arthropoden. Mit Angabe der Lebensweise und Beschreibung neur Arten. Berlin, 1894.

3. Neue Bestaetigungen der Lomechusa-Pseudogynentheorie, Verhandlungen der deutschen Zoologischen Gesellschaft, 1902, pp. 98–108.

EXPLANATION OF PLATE XX.

Fig. 1.—*Xenodusa cava* Lec. (original).

Fig. 2.—*Formica sanguinea* subsp. *rubicunda*, Em. a = female; b = *pseudogyne*; c = normal worker (original).

Fig. 3.—Thorax of a normal worker of *F. rubicunda* (original).

Fig. 4.—Thorax of a *pseudogyne* of *F. rubicunda* (original).

On the Discovery of Fig-insects in the Philippines.

By WILLIAM H. ASHMEAD.

Representatives of nearly all the known families of the Hymenoptera are rapidly being discovered in the Philippine Islands, and I have now the pleasure of recording the discovery, by Father Robert Brown, of fig-insects or, better, fig-wasps in the archipelago belonging to two distinct families,—Fam. Agaonidæ, or genuine fig-wasps, and Fam. Torymidæ, sub-fam. Idarninæ, or parasitic fig-insects.

The two species are described below.

Family AGAONIDÆ.

Genus **KRADIBIA** Saunders.

Kradibia brownii n. sp.

♀.—Length 0.9 mm.; ovipositor short, about one-third the length of the abdomen. Black and shining, the eyes pale, the scape and pedicel of the antennæ rufo-testaceous, the flagellum black or brown-black, the five last joints enlarged, the last joint the largest, oval; the legs—except the hind coxæ, which are black, and the very long tarsi, which are white—are brownish yellow; the wings are hyaline, but with the veins dark brown, the stigmal vein being slightly longer than the marginal, the postmarginal much longer.

Type, No. 8177, U. S. N. M.

Manila. Described from a single specimen.

This genus was originally described from Australia.

Family TORYMIDÆ.

Genus **SYCORYCTES** Mayr.

Sycoryctes philippinensis n. sp.

♀.—Length 1.4 mm.; ovipositor very long, nearly twice as long as the whole insect and clavate at tip. Brownish yellow, the eyes brown, the dorsum of abdomen towards base with a black spot, the sheaths of the ovipositor entirely black; the scape of the antennæ and the legs are pale yellowish, the flagellum being brownish; the wings are hyaline, the veins pale yellowish; the long stigmal vein is a little shorter than the marginal, the postmarginal vein being long.

Type, No. 8178, U. S. N. M.

This genus was originally described from Java, but I have representatives of it from Australia and New South Wales no yet described.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., DECEMBER, 1904.

There is one thing appertaining to entomology that has not developed in proportion to the growth and demand of the study. We refer to the entomological supply business. The commercial people have not seen the enormous increase of interest in our study and there is almost no competition among dealers in this country. In Europe the journals contain many advertisements of dealers offering all kinds of supplies and doubtless one can obtain almost anything promptly, while in this country there are only a very few dealers and they appear incompetent to properly handle the business. In Philadelphia with over a million people and many persons interested in entomology, there is not a single place where one can get satisfactory entomological supplies. If a museum or individual wishes insect boxes, from six months to a year will elapse before they are supplied, and one must suffer from stagnation and paralysis in caring for additional specimens or rearranging old. If a few thousand specimens are received they crowd up the temporary receptacles and must wait two or three months for printed pin labels before they can be incorporated in the collections, as it is impossible to get labels promptly. We have heard all the explanations and excuses for this condition of affairs and believe none of them valid. Is there not a man who will go into the business who is not suffering from the sleeping sickness? We believe a live, wide-awake firm or individual could build up a fine business in entomological supplies and appliances, but the business must be thoroughly understood.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

PROF. LEVI W. MENGEL has submitted to me a moth and a butterfly new to the fauna of the United States:—*Amblyscirtes elissa* Godman & Salvin, Biol. Cent.-Am., Tab. 95, fig. 40 ♀, fig. 41 ♂, Mexico; Cochise Co., Arizona, Biederman; *Melanchroia monticola* Schaus, Ent. Amer., 5, 192, 1889, Las Vigas, Mexico, Biol. Cent.-Am., Het., 2, 408, pl. 73, f. 33, 34; Reef, Cochise Co., Arizona, August 29, 1904, Biederman.—HENRY SKINNER.

ON THE METHOD OF "OARING" IN WATERBUGS (HEMIPTERA).—In "Half-hours with Insects,"* p. 158, Packard writes: "In this insect (i. e., *Notonecta*), as well as in *Corixa*, as Schiödte observes, the hind legs are moved both together, as in *Dytiscus*. In *Belostoma*, and probably *Ranatra*, they are moved alternately." Notes on the habits of waterbugs have been few and obvious, though the American forms at least are being zealously investigated by my friend Mr. Bueno.

Ranatra and *Nepa* are crawlers, slow and deliberate, over the bottom of pond or lake, or cling to the submerged parts of aquatic plants; even when moving through the water, their gait is rather a kind of paddling. *Belostoma*, on the other hand, has good serviceable oars (though not so remarkably modified for that purpose as in *Notonecta*), and alternate movements of the legs would produce much the same effect as that of a tyro rowing crew heedless of "time."

I have never seen any of the *Belostomidæ* alive; but I am sure, from an examination of their structure, that Packard's statement is incorrect. Unfortunately, the giant race has not yet reached these peaceful shores. My position in the matter is somewhat like that of Pooh-Bah. As a lover of waterbugs I would welcome them with open arms; as a professional economic entomologist, it would undoubtedly be my dolorous duty to exterminate them. G. W. KIRKALDY.

Honolulu, H. I., June 14, 1904.

EPIPYROPS BARBERIANA Dyar.—Recently Mr. Carl Hartman, of Austin, Texas, sent me a letter, accompanied by three specimens of *Epipyrops barberiana*, one male and two females, and a specimen of a Fulgorid, *Ormenis pruinosa* Say. Mr. Hartman in his letter says:

"There is a close social relation between the moths and the wax-producing Fulgorid. The latter insect carries under the left wing the mass of wax, or rather the waxen sac (several of which I send you) until ready to deposit the same. The lantern-fly lives, it seems, on the cedar bushes of this vicinity, and it is on them that the waxen sacs are almost exclusively found. The wax, when the sac is deposited, is soft and sticky, and can be drawn out into microscopically fine threads, a foot or

* "Half-hour Recreations in Natural History," Div. 1, pt. 5—Insects of the Pond and Stream. (No date—1874-5).

more in length, by touching the wax and removing the finger to a distance. The sacs are then pasted on the upper side of the sprays of cedar in the manner which you can see from the specimens. I got several insects and placed them in bottles over night. The sacs had been pasted to the bottles, and in doing this the wax had been smeared over a small area around the sacs in an 'untidy' fashion. In each case the Fulgorid was dead in the morning. It was from these sacs that the moths I send you were reared.

"I gathered, on September 10th, a dozen sacs and placed them in a bottle, with the result that two moths appeared on September 13th, and a chalcid-fly, which latter I shall send to Dr. Ashmead. The latter is most probably parasitic on the larva of the moth."

The observations of Mr. Hartman are of very great interest, and I hasten to communicate them to the ENT. NEWS. W. J. HOLLAND.

Carnegie Museum, Pittsburgh, Pa., June 14, 1904.

MEXICAN AND CENTRAL AMERICAN DRAGONFLIES (ODONATA).—I shall be glad to examine, name and return to the owner, or to purchase or otherwise acquire, Mexican and Central American dragonflies, in order to add to our information on this group for the *Biologia Centrali-Americana*. I particularly request any one having even one or two of these insects from these countries to communicate with me on this subject.—PHILIP P. CALVERT, Acad. Nat. Sciences, 1900 Race St., Philadelphia, Pa.

COCYTIUS CLUENTIUS Cr.—I took a specimen of this species at Detroit, Mich., July 11, 1904. Mr. A. W. Andrews and myself had been hunting sphinges, etc., on milkweed blossoms; but as our success was indifferent, owing to the immaturity of the flowers, we decided to examine the electric lights of Highland Park village. We at once met with success, and at the fourth or fifth light visited I found a huge sphinx, larger than any hitherto known to us around Detroit. It was lying on the asphalt pavement about fifteen feet from the base of the pole. Unfortunately, it had been injured, apparently by a passing wheel; yet it was bright and fresh and made a passable cabinet specimen. It was alive when taken, but offered very feeble resistance to capture.

The present specimen expands six and one-half inches (set in the usual way). It is a deep chocolate color, the forewing lightly irrorate with gray. Beneath the apex is a light brown patch, extending from the outer edge inwards, narrowing as it approaches—but not reaching—the middle of the wing. Along the inner margin is a large brown patch, somewhat darker than the other and crossed by several darker bands and shades. The hind wing has a pale area beyond the middle; the base is yellow, divided by a dark streak into two. The abdomen is of the same dark color above with gray irrorations, and has six yellow spots on each side. The specimen is a female.

The question arises—How did this sphinx get so far north? The nearest railroad, one-half mile away, runs east and west. Three miles south

are three other roads, connecting the city with all points of the compass. It was a hot sultry night with no wind and for the most part cloudy—an ideal night for collecting.

In the "NEWS," Vol. II, page 334, Mr. Troschel records the capture of *cluentius* at Chicago. Surely this species should now be on our list of Sphingidæ.

W. W. NEWCOMB, M.D.

Doings of Societies.

A meeting of the Feldman Collecting Social was held at the residence of Mr. Frank Haimbach, 1309 Allegheny Avenue, Philadelphia, October 19th, Mr. Erich Daecke, Vice-President, in the Chair. Nineteen persons were present. Dr. Calvert exhibited larvæ and pupæ of the bee-moth and said they were for distribution among the members. He said the wood under each cocoon was gnawed out for its reception, thus forming a little depression. The robber-moth, *Acherontia atropos*, was mentioned, and Mr. Daecke said he took a fine specimen far out at sea, in the Mediterranean. Mr. Haimbach spoke of the great abundance of *Aletia argillacea* at St. Louis. He saw thousands and counted 42 on one window. Mr. Wenzel said he had been studying *Balaninus*, and found it extremely difficult to collect imagos, but had secured larvæ by the thousands. Many chestnuts from Timber Ridge, Va., contained larvæ of *B. rectus* and *proboscideus*. Mr. Huntington had seen a live scorpion brought into the Fair Grounds at St. Louis. He was under the impression that they were tropical in habitat. Mr. Viereck said the complex nomenclature of insects had not infrequently driven students away from entomology, and he gave the opinion of the Rev. Edward Everett Hale and other writers on the subject. Recently Dr. Graenicher, of Milwaukee, had sent him rare or new parasitic Hymeroptera reared from *Ceratina dupla*, which show how interesting are the biological studies irrespective of nomenclature. Mr. Greene reported the capture of *Cicindela purpurea* var. *limbalis* in Northern New Jersey in the neighborhood of Boonton on April 27th.

Mr. Daecke reported the capture of *Diachlorus ferrugatus* near Weymouth, N. J. Osten Sacken gives its distribution as

Mexico, West Indies, Honduras and Brazil. He also exhibited a new tabanid taken at Brown's Mills Junction, N. J., June 27th.

HENRY SKINNER, *Secretary, pro tem.*

A meeting of the American Entomological Society was held October 27th, Dr. Philip P. Calvert, President, in the chair. Eighteen persons were present. The President announced the death, on May 23rd, of Mr. Robert McLachlan, elected a correspondent of the Society December 10, 1866. Mr. Rehn exhibited seven species of *Taeniopoda*, which represents all the species but two. The genus can be divided into two parts by the character of the median carina of the pronotum. Since Bolivar made this division a connecting link had been found in Mexico. The species vary greatly in coloration. Upon being questioned Mr. McClendon, who had observed them in nature, said they did not fly. Mr. Ilg exhibited specimens of *Atteva aurea* taken at Philadelphia. Mr. Wenzel exhibited fine specimens of *Cychrus viduus* taken not far from the city limits, in Delaware County. They are very rare here, and the species had been taken by his father and grandfather. He also exhibited larvæ of *Balaninus rectus* and *proboscideus*. Dr. Calvert exhibited a specimen of *Somatochlora tenebrosa* taken by Mr. E. E. Wildman at Pocono Inn, Penna., August 1st, a new record for the State. It has, however, been found in New Jersey by Mr. Rhoads. Dr. Calvert read an abstract of the address of the President of the Belgian Entomological Society on the "Metamorphoses of Insects." Discussed by the members. Mr. Haimbach referred to the great variation in the larvæ of the Bombycine moths. Mr. Rehn spoke of the similarity of some adults in the Orthoptera and the difference among their nymphs. Mr. Wenzel quoted Mr. Joutel in differentiating *Saperda* larvæ by their workings in wood. Mr. Harvey exhibited some unknown galls found in ant's nests.

HENRY SKINNER, *Secretary.*

The thirteenth regular quarterly meeting of the Pacific Coast Entomological Society was held on August 20th, 1904, at the Café Odeon, 8 O'Farrell Street, San Francisco, President Fuchs in the chair.

Sixteen members and six visitors were present. Four new members were elected.

Fordyce Grinnell by letter stated that he had spent from May 30th to June 20th in the San Emiglio Mountains in Western Kern County, and ascended Mt. Pinos over 9000 feet altitude. In San Emiglio Cañon he found a species of *Lycæna* near *speciosa;* around Mt. Pinos a distinct *Satyrus*, a *Melitæa* near *gabbii*, and an *Argynnis* that he could not place, and a peculiar *Lycæna* of the *icaroides* group. On the Mojave Desert, near Lancaster, he took *Pholisora libya*, which is only found in the desert and hard to catch.

President Fuchs delivered an annual address and reported a "Collecting Trip" to Tulare County, California.

Mr. Frances X. Williams reported a collecting trip to Santa Cruz County, in June 20th–July 25th. He stated that the Hepialidæ have the habit of flying about for about 40 minutes up to 8.20 o'clock P. M. The males fly zigzag in sheltered spots, while the females are larger and darker and fly zigzag but continuously and scatter their eggs upon the ground.

Dr. F. E. Blaisdell reported a larva of *Omus sequoiarum* that was collected in Calaveras County, 1903, and that it had pupated. As soon as it was placed in a jar of earth it made a burrow and was fed on flies from June 25th to August 1st, when it closed its burrow and in a cell laid upon its back for six months, and at the end of January, 1904, it again became active and was fed on flies. About June 1st, 1904, it again closed its burrow and disappeared, but about July 15th it had pupated.

He also reported the finding of *Quedius fulgidus*, var. *erythrogaster*, *Fuchsina occulta*, *Gyrohypnus* sp., and the remains of *Aphodius cribricollis* in the wood-rats' nest in the Alhambra Valley, Contra Costa County.

Dr. E. C. Van Dyke in considering the species of *Amphicoma*, said that probably there was dichromatism in the species of the

Pacific Coast: *ursina*, the usual brown form and a rare melanotic form; *canina* with its var. *cooperi*, and what he believed will prove melanotic forms, *edwardsii* and *rathvoni*.

Mr. L. E. Ricksecker stated that he obtained a colony of *Chariessa elegans* on white oak. Eight or ten specimens were obtained from a dead but freshly cut tree.

Dr. Blaisdell exhibited a series of *Collops* collected in Contra Costa County, showing that the quadri-maculate forms are extreme variations in the color marking of the wholly dark elytral forms. And also a series of *Lina* showing that the wholly black, with the var. *confluens* are but color variations of *L. scripta*. He stated that the specific term of *Bembidium concinnum* was preoccupied, having been applied to an European species, and in its place he proposed that the species be known as *Bembidium perconcinnum* Blais. Mr. Roland Hayward called his attention to the need of renaming the species.

F. E. BLAISDELL, M. D., *Secretary*.

Minutes of meetings of Brooklyn Entomological Society, held at the residence of Mr. George Franck, 1040 DeKalb Avenue, Brooklyn, N. Y.

January 7, 1904.—Nineteen persons present, the President in the chair. The following were elected officers for the ensuing year: John B. Smith, President; Edward L. Graef, Vice-President; Christopher H. Roberts, Treasurer; Archibald C. Weeks, Secretary; Richard F. Pearsall, Librarian; George Franck, Curator; R. Ellsworth Call and Edward G. Love, members of Executive Committee, in conjunction with above-named officers.

Dr. Call reported that the Children's Museum of the Brooklyn Institute had prepared exhibits, which would be further extended showing the relations between plants and insects so far as the cross fertilization and pollinization of the former by the latter were effected.

Mr. Carl Schaeffer read a paper relating some of his collecting experiences at Brownsville, Texas, during the past season. So many of the trees, shrubs and plants were equipped

with spines or thorns that collecting was a matter of some difficulty. Insects of all orders were taken, but principally Coleoptera, of which some eighty species were not included in the North American check lists and nearly sixty species were new to science. Many of the insects taken belonged to the sub-tropical fauna which had invaded this region. Mr. Schaeffer exhibited drawings of many of the new species of Coleoptera, principally distributed among the Cleridæ, Malachidæ, Ptinidæ and Cerambycidæ, the former predominating.

Discussion by Messrs. Call, Smith, Schaeffer and Weeks as to what should govern the limits of a faunal region, with the conclusion that it was best determined by the character of the vegetation.

February 4, 1904.—Fifteen persons present, the Vice-President in the chair. Dr. Kenneth F. Junor, of Brooklyn, was elected a member. Mr. Engelhardt reported that he had found the bird's nests forming a portion of the collections of the Children's Museum infested with the larvæ of the clothes moth (*Tinea pellionella*). The materials in the nests were straw, sticks, cotton, leaves and feathers.

Dr. Call had found the same larvæ as well as those of the common *Dermestes* in the interior of dried crabs which had originally been preserved in alcohol and the same moth had riddled the wooden table covers under cases which had been standing for some little time.

Mr. Doll exhibited specimens of Lepidoptera taken by him at Brownsville, Texas, during the past summer, and described the relative rarity and previously recorded range of occurrence of each species. Many of the species were not only new to our fauna, but to science. Among them *Copidryas cosyra*, which until very recently had been limited to Mexico; species allied to *Ecpantheria*, *Dasylophia*, *Edema* and *Schizura*, new to our fauna; *Ecpantheria muzina*, a large number of imagos were obtained from a batch of 250 eggs, showing variations which had heretofore been described under independent names; *Melitæa perlula*, new to our fauna and heretofore recorded from Venezuela; *Anartia fatima*, new to our fauna and not in Dr. Holland's Book, previously recorded habitat, Cuba; *Krico-*

gonia lyside, many specimens taken showing great variation, probably heretofore described under various names; *Pyrgus pastor*, heretofore recorded from Mexico; *Nisoniades potrillo*, heretofore recorded from Mexico and Cuba.

March 3, 1904.—Twenty persons present, the President in the chair. Mr. Engelhardt, in extension of the discussion at the previous meeting, read a paper upon "Museum Pests, and Some of their Breeding Places." King crabs, lobsters and other crustaceans were attacked by both the larvæ of the clothes moth and *Anthrenus*, the ligaments being devoured to such an extent as to cause the joints to separate. The larvæ were active in all stages in warm rooms during the winter, despite contrary opinions. Bisulphide of carbon only partially destroyed these pests. The feathers and rags in bird's nests as well as dried bog grass, were attacked by the clothes moth. Powdered naphthaline was successfully employed in such cases. The book louse (*Atropos divinatoria*) not only devoured paste or glue used in binding, but also penetrated the shellac coating upon shells to reach the dried tissue beneath. Cockroaches and house crickets would devour insects while on setting boards. These should be laid or hung in tight closets or cabinets with powdered naphthaline sprinkled on the bottom and shelves. Mice and rats would also work havoc among living cocoons, or to an exposed collection, and were particularly persistent in their efforts to reach dried specimens of any kind.

Dr. Call mentioned that Indian garments as well as the feathers of mounted birds were frequently destroyed by the clothes moth and that in addition to carbon bisulphide he had used a toilet spray filled with corrosive sublimate dissolved in alcohol in the case of infested crustaceans.

Mr. Schaeffer suggested the thorough saturation of the interior of insect and other cases with carbolic acid, the odor of which, in his experience, had proved permanently effective without renewal.

Dr. B. S. Middleton (of Mullingar, Ireland, visitor), stated that his collection of Brazilian butterflies had been eaten by cockroaches in the hold of his ship, and Mr. Franck related

the same experience with ants in a consignment of specimens from Europe.

Discussion, in which the distribution of powdered naphthaline or carbolic acid in cabinets, closets and cases was admitted to be generally effectual for protection.

Professor Smith read a paper entitled "Some Remarks on Classification."

Discussion by Messrs. Call, Franck, Hoover and Smith, in which the improbability of an agreement on a uniform basis of classification was thought not likely to be soon, if ever, reached. ARCHIBALD C. WEEKS, *Secretary.*

OBITUARY.

We have learned with regret of the death of that veteran entomologist, Professor F. G. Schaupp. He was buried at San Antonio, Texas, on November 10th. Professor Schaupp was well known from his writings on Coleoptera published in the Bulletin of the Brooklyn Entomological Society, his principal work being Synoptic Tables of the Cicindelidæ. Since his removal to Texas he has done valuable work in collecting. We trust the Brooklyn Entomological Society will publish an account of his life.

Mr. J. T. Klein died, October 14th, suddenly, at his residence, of apoplexy, aged 58 years. He was born February 17, 1846, near Ortdruf, Thuringia, where he received a good education and came to America in 1867.

In 1872 he came to this place (Torrington, Conn.), when I became acquainted with him. He has been an ardent collector of Lepidoptera and Coleoptera, and his collection contains specimens from nearly every quarter of the globe. Through all these years he worked hard to interest others in the study of Entomology, and he was always glad to entertain visitors and show them his treasures.

Mr. Klein was a member of the Litchfield County Scientific Association and the Entomological Society "Iris" Dresden, Saxony. A wife, daughter and son survive him.—H. H. A.

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EXCHANGES.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Lepidoptera. I have a few *luna* cocoons to exchange for *ceanothi* or pupæ of *Papilios* not found in this locality.—Miss Kate W. Strong, Setauket, Long Island, New York.

I have a few live pupæ of *Deidamia inscriptum* to exchange. I wish live pupæ of *Darapsa versicolor* and *Calasymbolus astylus*.—R. R. Rowley, Louisiana, Mo.

Megachilidae of the Americas wanted for study. Will exchange or purchase.—E. S. G. Titus, Div. Entom. Dept. Agric., Washington, D. C.

Wanted.—Copies of ENT. NEWS for January, 1903, Vol. xiv, No. 1.—Henry Skinner, 1900 Race St., Philadelphia, Penna

Lepidoptera.—*Papilio gundlachianus* for exchange.—Captain Wirt Robinson, Fort Caswell, North Carolina.

Wanted for Cash—Living cocoons or pupæ of Lepidoptera of U. S. A. W. T. Page, 6 Rylett Crescent, Shepherd's Bush, London, W., England.

Lepidoptera to exchange for specimens not yet in my collection. Send lists to Adolph Fischer, 502 School Street, Chicago, Ill.

Exchange.—Coleoptera in papers, with data. Will collect in this locality this season. Send lists.—Rev. J. C. Warren, Argentine, Kans.

Have for exchange.—Named species of Coleoptera, named and unnamed species Lepidoptera, Hymenoptera, Diptera, Neuroptera and Odonata of this locality, for named species of U. S. and Canada.—A.W. Andrews, 180 Helen Ave., Detroit, Mich.

Wanted.—Material for the study of the hybrid or polymorphic butterflies of the genus *Basilarchia*, including larvæ or pupæ of *arthemis* or *astyanax*, imagos of *proserpina* or *arthechippus*, or any specimens showing unusual characters. Liberal exchange. Specimens retained will be deposited in Museum of Comparative Zoology.—W. L. W. Field, Milton, Mass.

Fertile ova of *Attacus yama-mai*, *Rhodia fugax*, *Calligula japonica* and *cecropia-ceanothi* hybrids for good exchange; will give cash or exchange for pupæ of *angulifera* and *ova* of *H. nevadensis*.—Jas. Mitchell, 212 Indiana Trust Building, Indianapolis, Indiana.

Cicindela wanted (Henshaw Numbers 19 to 32b inclusive). Coleoptera for exchange. Will collect in all Orders. Write before collecting.—V. E. Shelford, Zoology Building, Univ. of Chicago, Chicago, Ill.

Wanted—Insect galls and host plants for the study of distribution. Will exchange specimens.—Mel T. Cook, Greencastle, Ind.

Butterflies.—Will collect in this vicinity the coming season in exchange for named specimens in papers or expanded, found in other localities.—C. E. Montgomery, 10 Cabot St., Portsmouth, N. H.

I have *Triptogon occidentalis*, *modesta*, *Sphinx chersis*, *Amp. versicolor*, *Calocala relicta* var. *bianca*, *phalanga*, *lacrymosa*, *frederici* and pupæ of *P. astylus* in exchange for others of same genus or for small white roses.—Chas. F. Timm, 131 Ralph St., Brooklyn, N. Y.

Orthoptera.—Determined Colorado species to exchange for species not represented in the Collection here. C. P. Gillete, Ft. Collins, Colo.

Wanted.—*Papilios* of the world. Must be perfect. Send list and state what you wish in exchange. C. F. Groth, 141 E. 40th St., New York.

Wanted.—Fertile eggs of *Citheronia regalis* and *Basilana imperialis*. Will pay cash for twenty-four of each.—Phineas Whiting, 106 Fairmount St., Lowell, Mass.

Wanted in southern and western United States correspondents who will collect *Cicindela* in exchange for named Coleoptera of Mexico, South and Central America, Europe and Australia. Write at once. Zoological Museum, 37 Zoological Building. University of Chicago, Chicago.

Insects of all orders, chiefly from Kansas, Colorado, New Mexico and Arizona, for North Amercan species not in my collection. List of duplicates and desiderata on application. F. H. Snow, Lawrence, Kansas. (Prof. Systematic Entomology in the University of Kansas.)

Wanted, to complete files: Illinois State Laboratory Natural History, Bulletin, Vol. i, Nos. 3 and 4; Vol. iv, articles, 9, 14 and 15; Vol. v, articles 1 and 6 Many valuable exchanges to offer in different groups and subjects. James G. Needham, Lake Forest, Ill.

Wanted to exchange Lepidoptera. Write before sending list.—D. F. Berrenger, Fostoria, Ohio.

A few examples of *Microcyptus testaceus* Lec. for exchange. Desire Cleridæ and Cerambycidæ.—L. H. Joutel, 164 E. 117 St., N. Y. City.

Lepidoptera.—I have a large number of duplicates for exchange. Also pupæ, including *Triplogon modesta*, and other *sphinges*. Address Frank H. Engl, 1048 Byron St., Chicago, Ill.

I have a German correspondent anxious to exchange perfectly prepared and named European insects in all families, and orders for American insects. Address and introduction supplied. W. D. Kearfott, 114 Liberty St., New York.

Callosamia calleta cocoons to exchange—*Sphinx* pupæ desired.—W. T. Buxton, 17 Walter St., Somerville, Mass.

Wanted all kinds of native pupæ and cocoons, take also rare p'ants in exchange for exotic and native butterflies. Chas. F. Timm, 131 Ralph St., Brooklyn, N. Y.

Lepidoptera, duplicates. Fine tropical diurnals from Gilolo, Borneo, Jamaica, Brazil, Peru, W. Africa, Cuba, offered. Wanted desiderata from Haiti, P. Rico, Phillippines, Ecuador, Bolivia, Amazon River, etc. Walter Dannatt, 75 Vanburgh Park, London, England.

Lepidoptera.—I have 250 *Luna* cocoons to exchange for others or for exotic butterflies in paper.—M. Reyher, 1601 Willington Street, Philadelphia, Pa.

Cocoons. of *Callosamia cynthia* to exchange for other cocoons of North American moths.—Miss E. Avery, McPherson Library, Indiana Avenue and F. Street, Philadelphia, Penna.

Hemiptera and Hymenoptera from all regions of the earth, mounted or unmounted named or unnamed. Will give for these named and mounted material in other Orders from Southwestern United States, Nicaragua and Cuba.—C. F. Baker, Estacion Agronomica, Santiago de las Vegas, Cuba.

Lepidoptera.—Pupæ and cocoons of native Papilios, Sphingidæ and Saturnidæ wanted in exchange for pupæ of *Pap. ajax*, Cresphontes, *Cith. regalis, Anisota rubicunda, senatoria, stigma* and hybernating larvæ of *Apatura, celtis and clyton.*—Earnest Jeheber, 118 Reservoir Street, Lancaster, Pa.

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